

ORIGINAL

Before the
Federal Communications Commission
Washington, D.C. 20554

RECEIVED

DEC - 4 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Amendment of the Commission's Rules to) GN Docket No. 96-228
Establish Part 27, the Wireless)
Communications Service ("WCS"))

DOCKET FILE COPY ORIGINAL

To: The Commission

COMMENTS OF PRIMOSPHERE LIMITED PARTNERSHIP

Primosphere Limited Partnership ("Primosphere"), by its attorneys, hereby respectfully submits these comments in response to the Commission's Notice of Proposed Rulemaking, FCC 96-441 (released November 12, 1996) ("Notice"), in the above-captioned proceeding. Primosphere is an applicant for authority to construct, launch and operate a Satellite Digital Audio Radio Service (SDARS) system in the 2310-2360 MHz band.¹

In the Notice, pursuant to the dictates of the Omnibus Consolidated Appropriations Act, 1997 ("Appropriations Act"),² the Commission proposes to establish a new Wireless Communications Service ("WCS") in the 2305-2320 and 2345-2360 MHz bands and to award licenses in this service by competitive bidding. The Commission proposes to allocate these bands to the fixed, mobile and radiolocation services and to retain the broadcasting-satellite allocation in the 2310-2320 and 2345-2360 MHz bands.

¹ See Primosphere Application, File Nos. 29/30-DSS-LA-93 and 16/17-DSS-P-93, filed on December 15, 1992.

² P.L. 104-208, 110 Stat. 3009 (1996).

0214

I. Existing SDARS Applications Should Be Processed First.

Given the broad range of potential applicants in the WCS as proposed, the Commission cannot know now how spectrum in the WCS ultimately will be used. It is certainly envisioned, however, that among other applications, the Commission may award part of the new spectrum to an entity intending Satellite Digital Audio Radio service.³ The Appropriations Act dictates that the Commission begin the competitive bidding process for WCS frequencies by April 15, 1997. Primosphere's SDARS application has been on file for four years. The possibility that competitors could receive licenses in the Spring of 1997 makes it even more important that the Commission take action before that time with regard to the pending SDARS applications. If, indeed, the four pending SDARS applications are to be dealt with by competitive bidding, then let that SDARS auction take place first.

Simple equity dictates that the present pool of SDARS applicants be treated before licenses are granted to others. The present SDARS applicants have weathered years of wait. First, before the Commission could entertain a domestic allocation, it was necessary for an international allocation made at the 1992 World Administrative Radio Conference (WARC-92).⁴ Subsequently, the Commission, through its notice and comment process, allocated 2310-2360 MHz for SDARS use.⁵ It was then necessary to

³ The Appropriations Act requires the Commission to assign the use of 2305-2320 MHz and 2345-2360 MHz by competitive bidding consistent with Section 309(j) of the Communications Act. Section 309(j)(1) makes it clear that competitive bidding is only to apply in cases of mutually exclusive applications. Section 309(j)(6)(E) requires the Commission to attempt engineering solutions, negotiation, threshold qualifications, service regulations and other means in order to avoid mutual exclusivity. As Primosphere and the other SDARS applicants have made quite clear in their comments and reply comments in Docket 90-357, they are each prepared to operate in 12.5 MHz of the 2310-2360 MHz band already allocated for SDARS use. Thus a significant portion of the spectrum proposed for WCS use can be assigned without competitive bidding and, pursuant to Section 309(j), should not be assigned by competitive bidding.

⁴ See International Telecommunication Union, Final Acts of the World Administrative Radio Conference (Malaga-Torremolinos, 1992).

⁵ 10 FCC Rcd. 2310 (1995).

develop service and licensing rules. These were proposed on June 15, 1995.⁶ Comments and reply comments from all interested parties have been on file at the Commission for more than a year. In the interim, the Commission has considered pioneer's preference issues, has received the recommendation of a peer review panel, and has now received letters from the three pioneer's preference applicants withdrawing their preference requests. Thus, at last, all required steps of the administrative process have been taken. The Commission has before it all information necessary to proceed with adoption of service rules and licensing of the applicants. Throughout this proceeding, Primosphere and the other applicants have invested considerable resources, honed their proposals, and supplied the Commission with all information needed to move forward.⁷ In other words, the present applicants have "walked the walk." They have done their part. The Commission has done its part. For the Commission now to license other, competing SDARS systems first would call into question the basic integrity of the Commission's rulemaking processes.

If, under the WCS umbrella, other SDARS services are licensed first, the present applicants will be at a competitive disadvantage. There will be an erosion of customer base while Primosphere and the other original applicants are forced to wait on the sidelines. Entire business plans and investments may have to be reconsidered.⁸ A new level of

⁶ 11 FCC Rcd. 1 (1995).

⁷ See Comments of Primosphere Limited Partnership in GEN Docket No. 90-357, IB Docket No. 95-91 filed September 15, 1995. As Primosphere pointed out there (at p. 2), the four applicants' filing/processing fees paid to the Commission total more than \$420,000. Those fees were paid in 1992-93, and there has been virtually no processing of the applications since then.

⁸ The SDARS applicants have invested significant resources and effort in developing receiver standards. They have funded several field experiments to evaluate potential SDARS receiver designs. They have worked extensively with technical laboratories in academia, government and industry to advance SDARS receiver technology. This knowledge base is critical to the implementation of SDARS. Thus, any establishment of SDARS receiver standards should be delayed until licenses have been granted in the 2320-2345 MHz band.

uncertainty will have been injected into a process already uncertain from the years of working through the administrative process.

In the Appropriations Act the Congress addressed its public safety concerns by directing the Commission to take into account the needs of public safety radio services when assigning the use of the 2305-2320 MHz and 2345-2360 MHz bands. Primosphere is the only applicant which has proposed a national, unscrambled, free broadcast service. Primosphere takes this opportunity to remind the Commission that, for its part, Primosphere has proposed to provide an "override" for all of its channels for critical information such as weather emergencies.⁹ Primosphere will make available one of its channels for such public emergency announcements. When emergencies occur, Primosphere will make periodic announcements on all its other channels that information about and for the emergency area is available on the specified channel. Emergency and other public safety information would be of vital interest to the public, particularly in rural areas where SDARS can be expected to have a considerable audience. In addition to the public interest value of regular SDARS fare -- a full menu of varied musical formats -- SDARS can service the public with timely, essential public safety information. The Commission's statutory obligation to act speedily in the instant proceeding should not be used as an excuse to delay further SDARS licensing. Indeed, regardless of this proceeding's outcome, Primosphere urges the Commission to give the present SDARS applicants the expedited consideration they deserve, by processing the four pending applications either as the applicants have proposed, with each licensee receiving 12.5 Mhz in the 2310-2360 MHz band, or through competitive bidding for two 12.5 MHz licenses in

⁹ Primosphere Ex Parte filing of May 2, 1996

the 2320-2345 MHz band. In either case such action should not await action in this proceeding.

II. Commission Decisions Regarding the WCS Must Ensure that a Viable Satellite DARS Service Can Be Implemented.

A. Out-of-Band Emission Limits. The Commission has proposed out-of-band emission limits for WCS operations in order to protect adjacent SDARS at 2320-2345 MHz. The Commission proposed that emissions outside of the WCS bands not exceed the following:

70 + 10Log(p) dB/MHz for fixed operations
43 + 10Log(p) dB/MHz for mobile operations

where p is the maximum spectral power density.

Although the Commission shows a proper concern for the potential for adjacent channel interference, Primosphere's analysis (see attached Technical Statement) shows that these proposed limits will still result in unacceptable WCS out-of-band emissions into the SDARS band. SDARS receivers will be extremely sensitive and will be connected to non-steered, broad-beam antennas. Primosphere addresses three scenarios in which interference might be expected: Where an SDARS receiver is 100 feet away from a tower-mounted fixed WCS transmitter with a directional antenna; where an SDARS receiver is 100 feet from a tower-mounted fixed WCS transmitter with an omnidirectional antenna; and where a hand-held WCS transmitter is three feet from an SDARS equipped vehicle. In this, the most likely, situation, WCS generated noise in the SDARS band would exceed the SDARS system noise level by 80 dB! Such interference, of course would be more than a mere annoyance. It would render SDARS completely unusable. Primosphere's technical analysis explains these conclusions and proposes new out-of-band

emissions criteria that are feasible and can be met affordably through the use of inexpensive filters representing minimal incremental cost to a WCS system and the establishment of narrow guard bands adjacent to the SDARS band.

B. WCS Power Levels. It should be noted that SDARS signals are of very low level and will not cause any interference to adjacent band WCS services. However, since SDARS receivers are designed to receive these low level signals and have inherent wide band characteristics, without the use of costly filters, they may experience interference from WCS transmitters operating in WCS bands. Primosphere therefore requests the Commission to take all necessary steps to limit the transmitter power levels in any service using the WCS bands so that they accommodate SDARS operations. These limits should be imposed by the Commission prior to any service allocations of the WCS bands.

C. The Commission Should Adopt a Consistent Approach to Aeronautical Telemetry Services. In its Notice, the Commission proposes to revise a number of U.S. footnotes to the table of allocations so that aeronautical telemetry and associated telecommand use of the bands 2310-2320 MHz and 2345-2360 MHz are secondary to the new WCS. However, the Commission does not propose a similar approach to aeronautical telemetry services in the 2320-2345 MHz band. Rather a new U.S. footnote is proposed which provides:

US 328. In the band 2320-2345 MHz, the mobile and radiolocation services are allocated on a primary basis until 1 January 1997 or until broadcasting-satellite (sound) service has been brought into use in such a manner as to affect or be affected by the mobile and radiolocation services in those service areas, whichever is later.

The approach taken with respect to SDARS is not consistent with that taken for the proposed WCS. US 328 delays the imposition of secondary status for aeronautical telemetry services in the SDARS band until some future date, whereas in WCS bands secondary status for aeronautical telemetry services is proposed to take effect upon adoption of the WCS rules. Moreover, the Commission has outstanding in the SDARS Notice a proposal to revise Section 87.303 of its rules to make aeronautical telemetry services secondary in the entire 2310-2360 MHz band. In addition, as the Commission noted in its Notice, it has stated that it would be necessary to accommodate aeronautical telemetry services in the 2360-2390 MHz band. These various proposals, spanning two outstanding rulemaking proceedings, are confusing.

The Commission must clarify that mobile and radiolocation services, including telemetry and telecommand for flight testing, will not be permitted to operate co-frequency with the broadcasting-satellite (sound) service. Spectrum sharing between SDARS and aeronautical telemetry is not technically feasible, even with aeronautical telemetry operating on a secondary basis. The Commission must ensure that SDARS operations in the 2320-2345 MHz band are protected from mobile and radiolocation services and that after SDARS is implemented there will be no further use of the 2320-2345 MHz band for aeronautical telemetry. Consequently, Primosphere opposes maintaining aeronautical telemetry allocations in the 2310-2360 MHz band even on a secondary basis.

D. Consistency with Law and Prior Commission Findings. If the Commission fails to adopt sufficient rules regarding out-of-band emissions and prioritization of SDARS, it may seriously be questioned whether the Commission intends spectrum already

allocated for SDARS to be used for that purpose. Under these circumstances, Primosphere reserves the right to challenge the legal basis of the WCS proposal due to concerns regarding whether: 1) the proposal unlawfully seeks to re-open the four-year old cut-off for SDARS applications; 2) the Commission has complied with 47 U.S.C. Sec. 309(j)(6)(E); 3) the Commission has decided issues in the WCS proceeding that are the subject of the pending SDARS rulemaking, and 4) there is sufficient record evidence to overturn the Commission's previous finding that the allocation of the 2310-2360 MHz band to SDARS was in the public interest.

III. Conclusion.

Primosphere urges that the Commission, while complying with the dictates of the Appropriations Act, not eliminate the opportunity for SDARS to develop as a valuable service for the American public.

Respectfully submitted,

PRIMOSPHERE LIMITED PARTNERSHIP

By: 

Leslie A. Taylor
Guy T. Christiansen
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, MD 20817-4302
(301) 229-9341

Its Attorneys

December 4, 1996

TECHNICAL STATEMENT

In its WCS NPRM, the FCC proposes out-of-band emission criteria for fixed, mobile and satellite DARS services in the bands set aside for WCS. The proposed limits for out-of-band emissions spectral density from WCS operations into the spectrum set aside only for Satellite DARS, 2320 to 2345 MHz, may not exceed the following:

$70 + 10\text{Log}(p)$ dB/MHz	fixed services
$43 + 10\text{Log}(p)$ dB/MHz	mobile operations

Where p is the maximum spectral power density.

Our analysis shows that these proposed limits will result in unacceptable WCS out-of-band emissions into the band set aside for satellite DARS services, 2320 to 2345 MHz. If adopted, these limits will seriously disrupt satellite DARS services planned for the band 2320 to 2345 MHz. This Technical Statement analyzes the level of this disturbance and proposes alternative limits for out-of-band emissions spectral density from WCS operations into the band 2320 to 2345 MHz.

INTERFERENCE ANALYSIS

Satellite DARS will employ sensitive satellite receivers connected to omnidirectional antennas. Our analysis considers three WCS transmission modes:

1. Fixed transmitter, directional antenna;
2. Fixed transmitter, omnidirectional antenna; and
3. Mobile transmitter, omnidirectional antenna.

This interference analysis is based on limiting interference from WCS to satellite DARS to no more than a 0.2 dB or 5% increase in satellite DARS system noise. The Primosphere mobile receivers operating will have system noise temperatures of approximately 200° kelvin and a 3 dB gain omnidirectional antenna.

In cases 1 and 2 we assumed the WCS transmitter was on a tower 100' away from the satellite DARS receiver operating in a mobile vehicle. In case 3 we assumed that the WCS transmitter was hand held and 3' away either in the satellite DARS equipped mobile vehicle or adjacent to it. It is worth noting that although this places the WCS transmitter in the satellite DARS antenna near field we have used far field antenna gain. The calculation of near field antenna gain would greatly complicate these calculations and not significantly change the results. We believe this to be a reasonable worst case for "PCS like" mobile operations in the WCS bands.

Although the probability of a mobile vehicle with satellite DARS driving through the beam of a directional fixed WCS antenna is low, case 1 must be addressed. Satellite DARS must be protected since a satellite DARS equipped vehicle may be stopped or parked

close to a fixed WCS service tower, or a listener with a fixed satellite DARS receiver may be in a WCS fixed service beam. Therefore we have combined our treatment of cases 1 and 2 into one analysis.

The results of our analysis for cases 1, 2 and 3 are contained in Table 1. Cases 1 and 2 are combined in the column titled "Fixed." These results clearly show that interference for cases 1 (fixed transmitter, directional antenna), 2 (fixed transmitter, omnidirectional antenna) and 3 (mobile) WCS operations, will greatly exceed acceptable limits for satellite DARS. In fact for case 3 WCS generated noise in the satellite DARS band would exceed the satellite DARS system noise level by an intolerable 80 dB. At this level, a single WCS mobile transmitter operating within 10 km of the satellite DARS receiver will increase noise in excess of 0.2 dB.

REQUIRED SOLUTION

The proposed out-of-band emission criteria for fixed, mobile and satellite DARS services in the bands set aside for WCS as contained in the NPRM are inadequate to protect satellite DARS. These limits need to be modified. It is recommended that the proposed limits be set as follows:

Out-of-band emissions spectral density from WCS operations into the spectrum set aside only for satellite DARS, 2320 to 2345 MHz, may not exceed:

$92 + 10\text{Log}(p)$ dB/MHz	fixed services, directional antenna
$92 + 10\text{Log}(p)$ dB/MHz	fixed services, omnidirectional antenna
$123 + 10\text{Log}(p)$ dB/MHz	mobile operations

Where p is the maximum spectral power density, within the band of operation.

Note: Primosphere has used the resolution bandwidth of 1 MHz, as proposed by the Commission. However an additional requirement is proposed that the out-of-band emission should not exceed 24 dB higher than the above numbers if measured in any 4 kHz slot in the band 2320 to 2345 MHz.

These tightened out-of-band emissions standards are feasible and can be met through the use of affordable and available filters in the WCS transmitters and the establishment of guard bands within the WCS band segments adjacent to the satellite DARS band. These guard bands would only apply to transmitters operating in the WCS band segments adjacent to the satellite DARS band. It has been assumed that a mobile PCS unit will have a 100 kHz bandwidth and transmit at approximately 1 watt (0 dBW). With these operating characteristics a 10 section Chebyshev transmit filter and a frequency guard

band on the order of 100 to 150 kHz are sufficient to reduce out-of-band emissions to the new levels stated above to protect the satellite DARS operations. Transmit filters in the WCS bands with these characteristics are technically feasible and can be implemented at low cost.

CONCLUSIONS

The out-of-band emission levels proposed from FCC Part 22 (47CFR 22.907 para b. (2)) are insufficient to protect satellite DARS from WCS operations. The proposed levels are inappropriate for WCS as they would allow a very high and totally unacceptable level of interference into the satellite DARS mobile receivers. Indeed, in the case of hand held transmitters in automobiles, transmission levels would render SDARS impossible.

The above analysis shows that:

1. The out-of-band emission standards contained in the NPRM for the satellite DARS band are insufficient to protect satellite DARS from WCS operations;
2. A more appropriate standard for out-of-band emission spectral density from WCS operations into the spectrum set aside only for satellite DARS, 2320 to 2345 MHz, may not exceed the following:

$92 + 10\text{Log}(p)$ dB/MHz fixed services, directional antenna
 $92 + 10\text{Log}(p)$ dB/MHz fixed services, omnidirectional antenna
 $123 + 10\text{Log}(p)$ dB/MHz mobile operations

Where p is the maximum spectral power density within the band of operation.

3. The revised out-of-band emission standards are technically feasible and will have minimal impact to mobile WCS equipment designs.

Prepared by:

/s/ Richard Cooperman 12/04/96
Richard Cooperman Date

Kenneth H. Manning 12/04/96
Kenneth Manning Date

TeleCom Consultants
15001 Redgate Drive
Silver Spring, MD 20905
301 384 2753 tel 301 236 4828 fax